CLAIMS

1. An image data generation apparatus comprising:

reception means for receiving a parameter for displaying three-dimensional image data;

three-dimensional image display control information generation means for generating three-dimensional image display control information by encoding said parameter; and

file generation means for generating a multimedia information file including both of said three-dimensional image display control information and said three-dimensional image data or at least one of said three-dimensional image data and two-dimensional image data.

2. The image data generation apparatus according to claim 1, further comprising recording means for recording said multimedia information file.

3. The image data generation apparatus according to claim 1, wherein

said file generation means outputs said multimedia information file to an external communication path.

4. The image data generation apparatus according to claim 1, wherein

said three-dimensional image display control information includes at least one of first information indicating a number of viewpoints of said three-dimensional image data, second information indicating from which viewpoint position said three-dimensional image data is obtained, third information indicating a direction of sub-sampling of said three-dimensional image data, fourth information indicating arrangement of a camera that has picked up said three-dimensional image data, fifth information indicating a maximum shift amount when a parallax image of said three-dimensional image data is

shifted, sixth information indicating whether a border is to be displayed around an image of said three-dimensional image data, seventh information indicating border image data to be displayed around the image of said three-dimensional image data, and three-dimension identification information indicating that said multimedia information file contains the three-dimensional image data.

5. The image data generation apparatus according to claim 4, wherein said three-dimension identification information adapts to a plurality of different three-dimensional display methods and is different for each of said plurality of three-dimensional display methods.

6. The image data generation apparatus according to claim 1, wherein said file generation means provides a different extension to said multimedia information file between when said multimedia information file contains the three-dimensional image data and when said multimedia information file contains no three-dimensional image data.

7. The image data generation apparatus according to claim 6, wherein said extension adapts to said plurality of different three-dimensional display methods and is different for each of said plurality of three-dimensional display methods.

8. An image data generation apparatus, comprising:

reception means for receiving a parameter indicating an image pick-up condition for a three-dimensional image;

information generation means for generating image pick-up condition information by encoding said parameter; and

file generation means for generating a multimedia information file including at least one of said image pick-up condition information, three-dimensional image data and

two-dimensional image data.

9. The image data generation apparatus according to claim 8, wherein

said image pick-up condition information includes at least one of information specific to a single viewpoint and information indicating a relation among viewpoints.

10. An image data generation apparatus generating a multimedia information file including at least one of image pick-up condition information indicating an image pick-up condition for a three-dimensional image, three-dimensional image data and two-dimensional image data, wherein

said image pick-up condition information includes at least one of information indicating a number of parallaxes in a horizontal direction and information indicating a number of parallaxes in a direction perpendicular thereto.

11. An image data generation apparatus generating a multimedia information file including at least one of image pick-up condition information indicating an image pick-up condition for a three-dimensional image, three-dimensional image data and two-dimensional image data, wherein

said image pick-up condition information includes at least one of information indicating a camera arrangement shape, information indicating an interval between adjacent cameras, and information indicating a distance from a camera arrangement plane to a convergence point.

12. An image data reproduction apparatus, comprising:

reception means for receiving a multimedia information file including both of three-dimensional image display control information generated by encoding a parameter for displaying three-dimensional image data and said three-dimensional image data or at least one of said three-dimensional image data and two-dimensional image data;

file structure analysis means for analyzing a structure of said multimedia information file so as to extract the three-dimensional image display control information and said three-dimensional image data or said two-dimensional image data;

three-dimensional image display control information analysis means for analyzing said three-dimensional image display control information;

data reproduction means for reproducing said three-dimensional image data; and

data conversion means for converting said reproduced three-dimensional image data; wherein

said data conversion means converts said reproduced three-dimensional image data for data for display based on a result of analysis by said three-dimensional image display control information analysis means.

13. The image data reproduction apparatus according to claim 12, wherein

said three-dimensional image display control information includes at least one of first information indicating a number of viewpoints of said three-dimensional image data, second information indicating from which viewpoint position said three-dimensional image data is obtained, third information indicating a direction of sub-sampling of said three-dimensional image data, fourth information indicating arrangement of a camera that has picked up said three-dimensional image data, fifth information indicating a maximum shift amount when a parallax image of said three-dimensional image data is shifted, sixth information indicating whether a border is to be displayed around an image of said three-dimensional image data, seventh information indicating border image data to be displayed around the image of said three-dimensional image data, and three-dimension identification information indicating that said multimedia information file contains the three-dimensional image data.

14. The image data reproduction apparatus according to claim 12 or 13, further comprising file type determination means for analyzing a structure of said

multimedia information file so as to determine whether three-dimensional image display control information is included; wherein

said file type determination means determines whether said multimedia information file includes the three-dimensional image data.

15. The image data reproduction apparatus according to claim 12 or 13, further comprising file type determination means for analyzing a structure of said multimedia information file so as to determine whether three-dimension identification information is included; wherein

said file type determination means determines whether said multimedia information file includes the three-dimensional image data.

16. An image data reproduction apparatus, comprising:

reception means for receiving a multimedia information file including three-dimensional image display control information obtained by encoding a parameter for displaying three-dimensional image data and said three-dimensional image data or two-dimensional image data; and

file type determination means for analyzing an extension of said multimedia information file; wherein

said file type determination means determines whether said multimedia information file includes said three-dimensional image data based on said extension.

17. The image data reproduction apparatus according to claim 16, wherein

said three-dimensional image display control information includes at least one of first information indicating a number of viewpoints of said three-dimensional image data, second information indicating from which viewpoint position said three-dimensional image data is obtained, third information indicating a direction of sub-sampling of said three-dimensional image data, fourth information indicating arrangement of a camera

that has picked up said three-dimensional image data, fifth information indicating a maximum shift amount when a parallax image of said three-dimensional image data is shifted, sixth information indicating whether a border is to be displayed around an image of said three-dimensional image data, seventh information indicating border image data to be displayed around the image of said three-dimensional image data, and three-dimension identification information indicating that said multimedia information file contains the three-dimensional image data.

18. An image data reproduction apparatus reproducing a multimedia information file including at least one of image pick-up condition information indicating an image pick-up condition for a three-dimensional image, three-dimensional image data and two-dimensional image data, wherein

said image pick-up condition information includes at least one of information indicating a number of parallaxes in a horizontal direction and information indicating a number of parallaxes in a direction perpendicular thereto.

19. An image data reproduction apparatus reproducing a multimedia information file including at least one of image pick-up condition information indicating an image pick-up condition for a three-dimensional image, three-dimensional image data and two-dimensional image data, wherein

said image pick-up condition information includes at least one of information indicating a camera arrangement shape, information indicating an interval between adjacent cameras, and information indicating a distance from a camera arrangement plane to a convergence point.

20. An image data recording medium recording a multimedia information file including both of three-dimensional image display control information generated by encoding a parameter for displaying three-dimensional image data and said three-

dimensional image data or at least one of said three-dimensional image data and two-dimensional image data.

21. The image data recording medium according to claim 20, wherein said three-dimensional image display control information includes at least one of first information indicating a number of viewpoints of said three-dimensional image data, second information indicating from which viewpoint position said three-dimensional image data is obtained, third information indicating a direction of sub-sampling of said three-dimensional image data, fourth information indicating arrangement of a camera that has picked up said three-dimensional image data, fifth information indicating a maximum shift amount when a parallax image of said three-dimensional image data is shifted, sixth information indicating whether a border is to be displayed around an image of said three-dimensional image data, seventh information indicating border image data to be displayed around the image of said three-dimensional image data, and three-dimension identification information indicating that said multimedia information file contains the three-dimensional image data.

22. The image data recording medium according to claim 21, wherein said three-dimension identification information adapts to a plurality of different three-dimensional display methods and is different for each of said plurality of three-dimensional display methods.

23. The image data recording medium according to claim 20 or 21, wherein said multimedia information file is provided with a different extension between when said multimedia information file contains the three-dimensional image data and when said multimedia information file contains no three-dimensional image data.

24. The image data recording medium according to claim 23, wherein

said extension adapts to a plurality of different three-dimensional display methods and is different for each of said plurality of three-dimensional display methods.

25. An image data recording medium recording a multimedia information file including at least one of image pick-up condition information indicating an image pick-up condition for a three-dimensional image, three-dimensional image data and two-dimensional image data, wherein

said image pick-up condition information includes at least one of information indicating a number of parallaxes in a horizontal direction and information indicating a number of parallaxes in a direction perpendicular thereto.

26. An image data recording medium recording a multimedia information file including at least one of image pick-up condition information indicating an image pick-up condition for a three-dimensional image, three-dimensional image data and two-dimensional image data, wherein

said image pick-up condition information includes at least one of information indicating a camera arrangement shape, information indicating an interval between adjacent cameras, and information indicating a distance from a camera arrangement plane to a convergence point.

27. An image data recording medium recording, in a recording area, a multimedia information file including both of image pick-up condition information generated by encoding a parameter indicating a condition in picking up a three-dimensional image and three-dimensional image data or at least one of the three-dimensional image data and two-dimensional image data.

28. The image data recording medium according to claim 27, wherein said image pick-up condition information includes at least one of information

specific to a single viewpoint and information indicating a relation among viewpoints.

29. The image data recording medium according to claim 27, wherein

said recording area includes an image recording area for recording the three-dimensional image data or the two-dimensional image data, an audio recording area for recording audio data, and a sub code area for recording associated information.

30. The image data recording medium according to claim 29, recording at least a portion of said image pick-up condition information in said image recording area.

31. The image data recording medium according to claim 29, recording at least a portion of said image pick-up condition information in said audio recording area.

32. The image data recording medium according to claim 29, recording at least a portion of said image pick-up condition information in said sub code area.

33. An image data recording medium recording, in a recording area, a multimedia information file including both of three dimensional image display control information generated by encoding a parameter for displaying three-dimensional image data and said three-dimensional image data or at least one of said three-dimensional image data and two-dimensional image data, wherein

said recording area includes an image recording area for recording said three-dimensional image data or the two-dimensional image data, an audio recording area for recording audio data, and a sub code area for recording associated information.

34. The image data recording medium according to claim 33, recording at least a portion of said three-dimensional image display control information in said image recording area.

35. The image data recording medium according to claim 33, recording at least a portion of said three-dimensional image display control information in said audio recording area.

36. The image data recording medium according to claim 33, recording at least a portion of said three-dimensional image display control information in said sub code area.